Towards the Synthesis of a C-glycoside Serine Tn Antigen

Thomson Ly
University Of Windsor, lyt@uwindsor.ca

Uwill Discover Abstract

Towards the Synthesis of a C-glycoside Serine Tn Antigen

Thomson Ly, Advait Desai, Iraj Sadraei, John F. Trant

Many biological processes including bacterial and viral infections (notably HIV and the flu), immunogenic responses, and cancer pathogenesis/metastasis are mediated by carbohydrate interactions. An example of such a carbohydrate is the Tn antigen. The Tn antigen is particularly interesting as it shows up in a large number of different cancer cells including: gastric, colon, breast, lung, esophageal, prostate, and endometrial cancer. If the immune system could be trained to target this molecule, then the immune system could be used to help cure cancer. A key drawback to using this method is the inherent low *in vivo* half-lives of carbohydrate containing materials. This Trant Team project aims to remove the unstable acetal functionality of the Tn antigen by replacing the exocyclic anomeric oxygen with a methylene (C-glycoside) to make new acetal-free *C*-glycoside analogues of the Tn antigen. Removing the labile functionality should result in greatly enhanced lifetime, and bioavailability relative to the native system with no loss of activity as the exocyclic oxygen is not involved in the vast majority of molecular recognition events. This molecule is being made by total synthesis for its incorporation into new anti-cancer vaccines.